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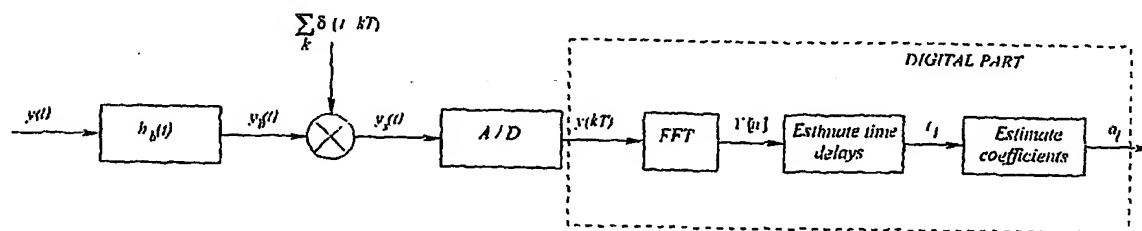
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ning of each regular issue of the PCT Gazette.

(54) Title: SYNCHRONIZATION AND CHANNEL ESTIMATION WITH SUB-NYQUIST SAMPLING IN ULTRA-WIDE-
BAND COMMUNICATION SYSTEMS



(57) Abstract: The system and method for estimating impulse response of a wideband communication channel represented as linear combination of L time-shifted pulsed $P_1(t)$ with propagation coefficients a_l , comprising functionalities or steps for obtaining an ultrawideband signal $y(t)$ of Fig. 1) received over the channel, filtered (h_{d1}) of Fig. 1) with low pass/bandpass filter and sampled uniformly at a sub-Nyquist rate; a functionality for determining discrete-Fourier-transform coefficients Y_j and S_j (FFT of Figure 1) from the sampled received signal and a transmitted ultra-wide-band pulse, respectively; a functionality for determining dominant singular vectors of a matrix having Y_{j+i4} / S_{j+i4} , as its i, j -elements; a functionality for determining dominant signal poles from the dominant singular vectors and determining the times shifts from the estimated powers; and a functionality for determining the propagation coefficients from a system of linear equalizations.